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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/988,948	11/19/2001	Antonio Jose Colmenarez	US010577	9179

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PHILIPS INTELLECTUAL PROPERTY & STANDARDS
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EXAMINER	
TUCKER, WESLEY J	
ART UNIT	**PAPER NUMBER**
2623	

DATE MAILED: 12/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/988,948	COLMENAREZ ET AL.	
	Examiner	Art Unit	
	Wes Tucker	2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 September 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 February 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicant's response filed September 1st, 2005 has been entered and made of record.

2. Applicant has not amended any claims. Claims 1-20 are currently pending.

3. Applicant's remarks have been fully considered, but are not found persuasive for at least the following reasons:

4. Applicant argues that the reference to Saneyoshi "fails to teach or suggest displaying the driving scene to the driver." This is absolutely false. Saneyosi discloses a display (Fig. 1, element 9) for showing a driver a driving scene (Fig. 6). Saneyoshi discosing a driving scene to a driver through a display cannot be made any clearer than that. Saneyoshi further discloses filter the images obtained from the cameras (Fig. 1, element 10) sending those imagesto an image processor and image processing computer (figure 1, elements 20 and 30). That image processor then filters the images to remove noise (Fig. 3, elements 30b and 40 and column 4, lines 59-65). The filtered images are then sent to the driving scene display (Fig. 1, element 9). There can be no mistaking that Saneyoshi teaches imaging a driving scene, filtering the scene image, and displaying that scene to the driver.

Saneyoshi does not discloses that the filtering to be a salt and pepper filter specifically for use with improving the driving scene when degraded by a weather condition. Alves discloses an image processor for enhancing images in the environment of detecting images of vehicles. Alves teaches the use of a median filter to be beneficial in reducing false detections during rain and snow (column 14, lines 1-5). Median filters are known to reduce salt and pepper noise and Alves teaches that such filtering is useful in the process of enhancing images including weather such as rain or snow. Saneyoshi teaches that there is a need for enhancing images by removing noise in a driver scene display environment. Alves clearly gives motivation for using a filter in order to enhance an image specifically degraded by weather. Therefore it would have been obvious to one of ordinary skill in the art to use a median filter as taught by Alves to enhance images that include weather degradation in order to improve the effectiveness of detection of other objects such as vehicles and to give better quality display image in general in cooperation with the noise filtering image enhancement of Saneyoshi in order to better enhance the driving image. These two references are combinable because they are both solving the same problem. They are both enhancing an image for better display of an outdoor environment involving driving conditions. Saneyoshi teaches enhancing an image of a driving scene and Alves teaches enhacing images degraded by weather. It is an obvious combination or art.

5. With regard to Applicant's remarks with regard to the infrared sections of the claims, the claims simply state that the camera is an infrared camera. Examiner

admits that Terakawa does not teach that even an infrared image might need slat and pepper filtering. Terakawa does however teach the use of an infrared camera (see abstract). Examiner points out that the Applicant's specification does not teach or even suggest the use of an infrared camera much less the filtering of images from such a camera. The only time infrared images are mentioned in the specification is in the background in regard to the imaging system available from Cadillac and the discussion seems to teach away from the use of an infrared camera in the presence of a weather condition. Therefore the claims citing the use of an infrared camera are not supported by the specification and are therefore rejected below under 35 USC 112 first paragraph as being new matter not supported in the specification.

6. The previously presented rejection is therefore maintained and accordingly made final.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 17 and 19 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure, which is not enabling. Claims 17 and 19 claim the use of an

infrared camera. There is no mention of an infrared camera or infrared imaging in the disclosure of the specification.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 1, 2, 13, 14, 16, 18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of U.S. Patent 6,122,597 to Saneyoshi et al. and U.S. Patent 5,535,314 to Alves et al.

With regard to claim 1, Saneyoshi discloses a system for displaying a driving scene to a driver of an automobile (Fig 1, elements 10, 20, 30, and 9).

Saneyoshi further discloses step a) at least one camera having a field of view and facing in the forward direction of the automobile and capturing images of the driving scene, the images comprised of pixels of the field of view in front of the automobile (Fig.1, element 10).

Saneyoshi discloses step b) a control unit that receives the images from the camera and applies a noise filtering to the pixels comprising the received images, the filtering improving the quality of the image of the driving scene received from the

camera when degraded (column 4, lines 59-65). Saneyoshi does not explicitly disclose a salt and pepper filter for use specifically with the image when degraded by a weather condition. Alves discloses an image processor for enhancing images in the environment of detecting images of vehicles. Alves teaches the use of a median filter to be beneficial in reducing false detections during rain and snow (column 14, lines 1-5). Median filters are known to reduce salt and pepper noise and Alves teaches that such filtering is useful in the process of enhancing images including weather such as rain or snow. Therefore it would have been obvious to one of ordinary skill in the art to use a median filter as taught by Alves to enhance images that include weather degradation in order to improve the effectiveness of detection of other objects such as vehicles in cooperation with the noise filtering of Saneyoshi in order to better enhance the driving image.

Saneyoshi further discloses c) a display that receives the images from the control unit after application of the filtering operation and displays the images of the driving scene to the driver (Fig.1, element 9).

With regard to claim 2, Alves discloses a median filter (column 14, lines 1-5).

With regard to claim 13, Saneyoshi discloses wherein the control unit further applies image recognition processing to the image following the filtering (column 8, lines 50-64).

With regard to claim 14, the discussion of claim 1 applies. Saneyoshi and Alves disclose a method used in the system disclosed.

With regard top claim 16, Saneyoshi discloses wherein the step of noise filtering of the pixels comprising the images is followed by the step of applying image recognition processing to the filtered pixels (column 8, lines 50-56).

With regard to claim 18, Alves discloses wherein the weather related condition is precipitation (column 14, lines 1-5).

With regard to claim 20, the discussion of claim 18 applies.

9. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of U.S. Patent 6,122,597 to Saneyoshi et al. and U.S. Patent 5,535,314 to Alves et al. and further in view of publication "SUSAN-A New Approach to Low Level Image Processing" by Stephen M. Smith et al. hereinafter referred to as Smith.

With regard to claim 3, Saneyoshi and Alves disclose a filtering that removes salt and pepper noise, but do not explicitly disclose a SUSAN filter. Smith discloses that the SUSAN filter clearly integrates the best aspects of the best of existing noise reducing

filters, including edge-preserving filters (p.68, below equation (36)). These are all desirable characteristics in the combination of Saneyoshi and Alves since Saneyoshi seeks to determine shapes of objects and preserving edges and removing noise is essential to the process. Therefor it would have been obvious to one of ordinary skill in the art at the time of invention to use the SUSAN filter as taught by smith in order to provide the best noise removal and edge preserving filter for use in removing noise while preserving shapes for detection.

10. Claims 4-11 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of U.S. Patent 6,122,597 to Saneyoshi et al. and U.S. Patent 5,535,314 to Alves et al. and further in view of U.S. Patent 6,219,447 to Lee.

With regard to claim 4, Saneyoshi and Alves disclose the system of claim 1, but do not disclose wherein the control unit further applies a histogram equalization operation to the intensities of the pixels comprising the filtered images, the histogram equalization operation further improving the quality of the images of the driving scene when degraded by the weather condition. Lee discloses the practice of histogram equalization in order to enhance images (column 2, lines 54-67). Lee teaches that the histogram equalization serves to enhances the appearance of the contrast of the image (column 1, lines 20-24) and that it may be performed in an active section of video image

(abstract). Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to use the histogram equalization as taught by Lee to enhance the already filtered video image of Saneyoshi and Alves in order to enhance the contrast appearance of the image.

With regard to claim 5, Saneyoshi discloses wherein the control unit applies image recognition processing to the images following the histogram equalization operation (column 8, lines 50-55).

With regard to claim 6, Saneyoshi discloses wherein the control unit applies image-recognizing processing to the images to identify objects therein of at least one predetermined type (column 8, lines 50-55).

With regard to claim 7, Saneyoshi discloses wherein objects of the at least one predetermined type comprise at least one selected from the group of: pedestrians, other automobiles, traffic signs, traffic controls, and road obstructions (column 8, lines 50-55).

With regard to claim 8, Saneyoshi discloses wherein objects of the at least one predetermined type identified in the images are enhanced by the control unit for display by the display (column 4, lines 60-67 and column 5, lines 1-20). Here the image types are considered to be enhanced by the filter and distance histogram for display enhancement.

With regard to claim 9, Saneyoshi discloses wherein the control unit further identifies features in the images of at least one predetermined type (column 8, lines 57-65 and column 8, lines 15-19 and Fig. 14). Here Saneyoshi discloses determining edges or groups of images and their distances. The groups determined and the distances are considered image features.

With regard to claim 10, the discussion of claim 9 applies. The features are determined for display.

With regard to claim 11, Saneyoshi discloses wherein the features of at least one predetermined type comprise borders of the roadway (Fig. 14)

With regard to claim 15, the discussion of claim 4 applies.

11. Claims 12 and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of U.S. Patent 6,122,597 to Saneyoshi et al. and U.S. Patent 5,535,314 to Alves et al. and further in view of U.S. Patent 5,926,164 to Terakawa et al.

With regard to claim 12, Saneyoshi and Alves disclose the system as in claim 1 and Saneyoshi discloses wherein the display is just below the driver's field of view (Fig. 1, element 9). Saneyoshi does not explicitly disclose that the display is a heads-up display. Terakawa discloses a heads up display (Fig. 2a, element 3). Heads up displays are known to be used in close proximity to the driver's or operator's field of view so that the driver does not have to look away from his/her path and natural field of view to view the display. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to implement the display of Saneyoshi as a heads-up display as shown in Terakawa so that the driver or operator need not look away from his/her path and natural field of view in order to view the display.

With regard to claim 17, Saneyoshi and Alves disclose the system of claim 1, but do not explicitly disclose that the camera used is an infrared camera. Terakawa discloses the use of an infrared camera in a vehicle display device and teaches that infrared rays are visible at longer distances than light rays in the visible spectrum and therefore when images or objects may be difficult to see in the visible spectrum they can be better seen in the infrared spectrum (see abstract). Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to use infrared imaging as taught by Terakawa in the imagers of Saneyoshi and Alves in order to enable better visibility of objects at greater distances from the vehicle.

With regard to claim 19, the discussion of claim 17 applies.

Conclusion

THIS ACTION IS MADE FINAL. See MPEP 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wes Tucker whose telephone number is 571-272-7427. The examiner can normally be reached on 9AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on 571-272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Wes Tucker

12-10-05

VIKKRAM BALI
PRIMARY EXAMINER